CLAIMS

We claim:

1. (Currently amended) A method of forming SiBCN-based ~~ceramics~~ preceramic polymers or oligomers, comprising the steps of:

reacting a disilazane having the general formula $(R_3Si)_2NH$, where R is selected from the group consisting of vinyl, hydrogen, phenyl, and alkyls containing 1 to 3 carbon atoms with a boron halide including at least two halogens and a halosilane including at least two halogens at a temperature of between 125 °C and 300 °C, wherein a SiBCN preceramic polymer or oligomer is formed, wherein a chlorine content of said preceramic polymer or oligomer as formed in said reacting step is less than 100 parts per million. ~~and~~

~~pyrolyzing said preceramic polymer or oligomer at a temperature that ranges from 700 °C to 1600 °C in a nonoxidizing atmosphere, said method being exclusive of a curing step before said pyrolyzing step in a halogen comprising environment, wherein said preceramic polymer or oligomer is converted into a ceramic~~

2. (Original) The method of claim 1, wherein said $(R_3Si)_2NH$ is $(CH_3)_3SiNHSi(CH_3)_3$).

3. (Original) The method of claim 1, wherein said boron halide is BCl_3 and said halosilane is R_1SiCl_3, where R_1 is selected from the group consisting of vinyl, hydrogen, phenyl, and alkyls containing 1 to 3 carbon atoms.

4. (Original) The method of claim 1, wherein said preceramic polymer or oligomer is directly formed exclusively by said reacting step.

5. (Currently amended) The method of claim 1, ~~wherein a chlorine content of said preceramic polymer or oligomer is less than 100 parts per million~~ further comprising the step of pyrolyzing said preceramic polymer or oligomer at a temperature that ranges from 700 °C to 1600 °C in an inert atmosphere, wherein said preceramic polymer or oligomer is converted into a ceramic.

6. (Currently amended) The method of claim ~~1~~ 5, wherein said ceramic is amorphous as evidenced by featureless XRD data.

7. (Cancelled)

8. (Cancelled)

9. (Cancelled)

10. (Currently amended) A ceramic formed from the process recited in claim ~~1~~ 5.

11. (Withdrawn) A SiBCN-based preceramic polymer or oligomer, comprising:

a silicon comprising backbone including boron and nitrogen, wherein said preceramic polymer or oligomer includes a plurality trialkylsilylamino groups.

12. (Withdrawn) The polymer or oligomer of claim 11, wherein said trialkylsilylamino groups comprise a plurality of trialkylsilylamino, triarylsilylamino, trivinylsilylamino or hydridosilylamino groups.

13. (Withdrawn) The polymer or oligomer of claim 11, wherein a chlorine content of said preceramic polymer is less than 100 parts per million.

14. (Withdrawn) A partially pyrolyzed SiBCN-based preceramic polymer or oligomer, comprising:

a silicon comprising backbone including boron and nitrogen, wherein said partially pyrolyzed preceramic polymer or oligomer provides hydrothermal stability and includes at least 3 wt % hydrogen.

15. (Withdrawn) The partially pyrolyzed preceramic polymer or oligomer of claim 14, wherein said % hydrogen is at least 4 wt %.

16. (Withdrawn) A burnable poison rod assembly (BPRA), comprising a bundle of control rods for insertion into a reactor core during refueling, said rods including said partially pyrolyzed preceramic polymer or oligomer of claim 14.

17. (Withdrawn) A spent fuel container (SFC) for storing spent nuclear fuel, wherein said SFC is formed from said partially pyrolyzed preceramic polymer or oligomer of claim 14.

18. (New) The method of claim 1, wherein a boiling point of said halosilane is less than 125 °C.

19. (New) The method of claim 1, wherein a stoichiometric excess of said disilazane is provided.

20. (New) The method of claim 1, wherein organic solvent is included in said reacting step.

21. (New) The method of claim 20, wherein a boiling point of said halosilane is less than 125 °C and a stoichiometric excess of said disilazane is provided.